Listă tutoriat 5

Calculați următoarele integrale triple:

a) $\iiint_A xy\,dxdydz$, unde $A=[1,2]\times[3,4]\times[7,8]$

b) $\iiint_A (x+y)\,dxdydz$, unde $A=[0,2]\times[-1,2]\times[-2,-1]$

c) $\iiint_A y\,dxdydz$, unde $A=\{(x,y,z)\in\mathbb{R}^3 \mid 1\le x^2+y^2+z^2\le 9\}$

d) $\iiint_A x\,dxdydz$, unde $A=\{(x,y,z)\in\mathbb{R}^3 \mid (x,y)\in B,\ x^2+y^2-1\le z\le 2-x^2-y^2\}$, $B=\{(x,y)\in\mathbb{R}^2 \mid x^2+y^2\le \frac{3}{2}\}$

e) $\iiint_A 1\,dxdydz$, unde $A=\{(x,y,z)\in\mathbb{R}^3 \mid (x,y)\in B,\ \frac{x^2+y^2+5}{2}\le z\le 4-x^2-y^2\}$, $B=\{(x,y)\in\mathbb{R}^2 \mid x^2+y^2\le 1\}$

f) $\iiint_A z^2\,dxdydz$, unde $A=\{(x,y,z)\in\mathbb{R}^3 \mid x^2+y^2\le z^2,\ 0\le z\le 1\}$.

g) $\iiint_A \left(\frac{x^2}{9}+\frac{y^2}{4}+\frac{z^2}{25}\right)dxdydz$, unde

$A=\{(x,y,z)\in\mathbb{R}^3 \mid \frac{x^2}{9}+\frac{y^2}{4}+\frac{z^2}{25}\le 1,\ y\le 0,\ z\ge 0\}$.

h) $\iiint_A \left(\frac{(x-3)^2}{4}+\frac{(y-2)^2}{9}+\frac{z^2}{25}\right)dxdydz$, unde

$A=\{(x,y,z)\in\mathbb{R}^3 \mid \frac{(x-3)^2}{4}+\frac{(y-2)^2}{9}+\frac{z^2}{25}\le 1\}$.